

ABSTRACT

A sensor comprising at least one photonic crystal, at least one light source capable of illuminating the crystal with a light beam having a predetermined wavelength and direction, and at least one position sensing detector positioned so as to detect the position of said light beam after it is transmitted by the crystal. Sensing is achieved by saturating the crystal with a liquid so as to produce a saturated crystal having a first refractive index, calculating for the crystal a dispersion surface and using the dispersion surface to calculate an effective incident light vector; and illuminating the saturated crystal with at least one light beam, the beam being incident substantially along the calculated effective incident light vector such that if the saturated crystal is modified to have a second refractive index, the position-sensing detector will detect a change in position of the transmitted light beam.